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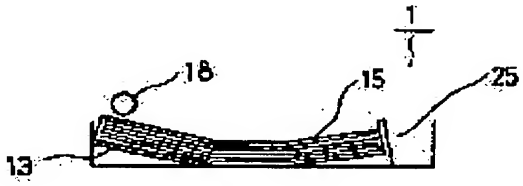
(54) SHEET LOADING DEVICE AND IMAGE FORMING DEVICE USING IT

(57)Abstract:
PURPOSE: To provide a sheet loading device where no troubles such as the duplicate feeding and jamming of the sheet occur even when the static electricity is generated in the sheet by providing a rear end regulating member which lifts and supports the lower part of the rear end of the loaded and stored sheet.
CONSTITUTION: A sheet loading device 1 is provided with a rear end regulating plate 25, and the part of the rear end regulating plate 25 where the rear end part of the sheet 15 is loaded is provided with an inclined surface, and the surface to regulate the rear end of the sheet is orthogonal to the inclined surface. This constitution allows the tip part of the sheet 15 to be lifted by a center plate 13, and the rear end part is lifted by the rear end regulating plate 25, and the sheet 15 is suspended in midair due to the stiffness of the sheet 15. Thus, a fine space is generated between the sheets 15, preventing the defective feeding such as the duplicate feeding of the sheet 15 by the electrostatic attraction. An electrically conductive substance such as metal is used for the material of the rear end regulating member 25 to remove the static electricity to be generated in the sheet 15.



LEGAL STATUS

[Date of request for examination]

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CLAIMS

[Claim(s)]
[Claim 1] The sheet loading equipment characterized by the thing raise the back-end lower part of the sheet by which loading receipt was carried out in order have the stowage material which carries out the loading receipt of many sheets, and a back-end regulation means regulate the back-end location of a sheet and selling a sheet, when said back-end specification-part material sags a sheet in the sheet loading equipment with which it comes to feed paper one sheet at a time from said stowage material, and it comes to support.
[Claim 2] Sheet loading equipment according to claim 1 which the contact section cross section of said back end specification-part material where the back end of a sheet contacts produces a location gap in the sheet conveyance direction for the shape of a wedge from nothing and the top sheet one by one, and comes to sell a sheet.
[Claim 3] Sheet loading equipment according to claim 1 which comes to have an oscillating generating means so that said stowage material may vibrate two or more sheets which are carrying out electrostatic adhesion with static electricity and may sell.
[Claim 4] Sheet loading equipment according to claim 1 which comes to have an electric discharge means by which said stowage material discharges static electricity of the sheet which is carrying out electrostatic adhesion, and improves separability of a sheet.
[Claim 5] a press means by which said stowage material presses down a sheet by predetermined thrust from the top sheet surface that the double feed of a sheet should be prevented -- an owner -- ** -- sheet loading equipment according to claim 1.
[Claim 6] Sheet loading equipment according to claim 5 which has the curved surface where radius of curvature is big, and becomes that it should always press in a field even if the height of the top sheet changes, when the number of sheets of the sheet into which the press side of said press means to press a sheet is loaded changes.
[Claim 7] Sheet loading equipment according to claim 5 which comes to have the press section which said press means becomes from the body of revolution which can be rotated freely.
[Claim 8] Sheet loading equipment according to claim 5 with which said press means comes to have the press section of an acute-angle configuration.
[Claim 9] Image formation equipment characterized by having the image formation section which carries out image formation of the manuscript information to a sheet, and claim 1 thru/or sheet loading equipment given [any 1] in five.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the sheet loading equipment which carries out the loading receipt of many sheets, and relates to the approach of solving the difficulty factor of separation feedings, such as static electricity generated on a sheet in detail.
[0002]
[Description of the Prior Art] Conventionally, the sheet loading equipment currently used for image formation equipments, such as a copying machine, is explained along with drawing 10 and drawing 11 . Drawing 10 is the plan of sheet loading equipment, and drawing 11 shows the B-B sectional view in drawing 10 . Sheet loading equipment has a frame 11 (stowage material), and the back end regulation plate 16 and the side regulation plate 17 for regulating the edge of a sheet are arranged in this frame 11. Moreover, a medium plate 13 is formed in the point of a frame 11, and this medium plate 13 is energized up (it sets to drawing 10 and is the upper part) by the compression spring 14. Furthermore, the separation pawl 12 is formed in the sheet conveyance direction (it sets to drawing 10 and is left-hand side) corner of a frame 11, and the point-angle section of a sheet 15 is stopped.
[0003] If feed actuation begins in the above-mentioned configuration, the feed roller 18 will carry out friction negotiations with the top sheet 15, and will feed paper to a sheet. Under the present circumstances, separation is performed when a sheet overcomes the separation pawl 12.
[0004]
[Problem(s) to be Solved by the Invention] However, with above sheet loading equipment, static electricity occurs on said sheet by the rubbing between the loaded sheets 1, exfoliation, etc., and, for this reason, strong electrostatic adhesion arises between sheets 15. In such a case, it was difficult to carry out the separation feed of every one sheet 15, and it caused [of the double feed or the jam] generating. Especially an electrification phenomenon such had the description which is easy to produce when humidity is low.
[0005] Then, this invention aims at offering the sheet loading equipment which the failure of the double feed of a sheet, a jam, etc. does not produce, and the image formation equipment using it, even if static electricity occurs on a sheet.
[0006]
[Means for Solving the Problem] The stowage material which this invention is made in view of the above-mentioned situation, and carries out the loading receipt of many sheets (11), In the sheet loading equipment with which it has a back end regulation means (25) to regulate the back end location of a sheet, and comes to feed paper one sheet from said stowage material (11) at a time It is characterized by the thing it raises and comes to support the back end lower part of the sheet by which loading receipt was carried out so that said back end specification-part material (25) may sell a sheet by sagging a sheet.
[0007] For example, the contact section cross section of said back end specification-part material (25) where the back end of a sheet contacts produces a location gap in the sheet conveyance direction for the shape of a wedge from nothing and the top sheet one by one, and comes to sell a sheet.
[0008] Moreover, it comes to have an oscillating generating means (27) so that said stowage material (11) may vibrate two or more sheets which are carrying out electrostatic adhesion with static electricity and may sell.
[0009] Moreover, it comes to have an electric discharge means (20) by which said stowage material (11) discharges static electricity of the sheet which is carrying out electrostatic adhesion, and improves separability of a sheet.
[0010] Moreover, said stowage material comes to have a press means (30) to press down a sheet by predetermined thrust from the top sheet surface that the double feed of a sheet should be prevented.
[0011] Moreover, when the number of sheets of the sheet into which the press side of said press means (30) to press a sheet is loaded changes, even if the height of the top sheet changes, that it should always press in a field, it has the curved surface where radius of curvature is big, and becomes.
[0012] Moreover, it comes to have the press section (31) which said press means (30) becomes from the body of revolution which can be rotated freely.
[0013] Furthermore, said press means (30) comes to have the press section (31) of an acute-angle configuration.
[0014] Moreover, as image formation equipment (2), it is characterized by the thing with the image formation

section which carries out image formation of the manuscript information to a sheet, and claim 1 thru/or sheet loading equipment given [any 1] in five.
[0015]
[Function] The separability of a sheet is improved by discharging static electricity which established a back end regulation means (25) to regulate the back end of the sheet loaded based on the configuration above, and sold the sheet by carrying out the sequential location gap of the sheet which this back end regulation means (25) raised the back end section of a sheet, or was loaded, and was generated on the sheet with an electric-discharge means (20). Moreover, by forming an oscillating generating means (27) in the stowage material (11) which is carrying out the loading receipt of the sheet, vibration is given to the stuck sheet and the separability of a sheet is improved by this vibration.
[0016] Furthermore, in order to prevent a double feed, a jam, etc. of a sheet which were loaded, the top sheet is pressed with a press means (30).
[0017] In addition, although the sign in the parenthesis mentioned above is for contrasting with a drawing, it does not limit the configuration of this invention at all.
[0018]
[Example]
<Example 1> The example 1 of this invention is explained along with a drawing below. in addition, the basic configuration of the sheet loading equipment in this example 1 -- a Prior art and abbreviation -- since it is the same, the same sign is attached and only difference is explained.
[0019] The field which, as for this back end regulation plate 25, the part in which the back end section of a sheet 15 is laid has an inclined plane by forming the back end regulation plate 25 (back end regulation means) as shown in sheet loading equipment 1 at drawing 1 , and regulates the back end of a sheet is constituted by said inclined plane and right angle. Since sheet 15 point is raised by the medium plate 13 and the back end section is raised with the back end regulation plate 25 by this, a sheet 15 becomes like air fishing with the nerve of a sheet 15. Therefore, detailed space occurs between sheets 15 and it becomes possible to prevent poor feed, such as a double feed of the sheet 15 by electrostatic adhesion of the sheet 15 by static electricity.
[0020] According to the experiment of an artificer, when 10,000 sheets were copied using the sheet 15 of A4 size, and the back end regulation plate 16 of structure was used conventionally, the sheet of ten sheets carried out the double feed, but when the back end regulation plate 25 of this example 1 was used, the double feed only of the two sheets was carried out.
[0021] In addition, if the ingredient of the back end specification-part material 25 is created with conductive matter, such as a metal, and this back end regulation plate 25 is installed as an approach of making effectiveness of this example 1 more remarkable, it will become possible to discharge static electricity generated on the sheet 15, and it will become possible to prevent poor feed, such as a double feed which static electricity produces owing to.
<Example 2> The example 2 of this invention is explained along drawing. in addition, the fundamental configuration of sheet loading equipment -- an example 1 and abbreviation -- since it is the same, the same sign is attached and only difference is explained.
[0022] Drawing 2 is what established the oscillating generating means for giving vibration to sheet loading equipment 1, and the oscillating generating means 28 consists of weight 26 and a motor 27. And this motor 27 is rotated at the time of feed actuation, vibration is given to sheet loading equipment 1, and it becomes possible to improve the separability between sheets 15 by vibrating the sheet 15 stuck by this vibration.
[0023] Of course, an oscillating generating means is not limited to the thing of a configuration of having mentioned above.
<Example 3> The example 3 of this invention is explained along drawing. in addition, the fundamental configuration of sheet loading equipment -- an example 1 and abbreviation -- since it is the same, the same sign is attached and only difference is explained.
[0024] Drawing 3 shows the plan of sheet loading equipment 1, and drawing 4 shows the sectional view of the A-A section in drawing 3 . Sheet loading equipment 1 has the electric discharge needle 20 (electric discharge means), the earth plate 21, and the back end regulation plate 29. It is prepared in the point of sheet loading equipment 1, and said electric discharge needle 20 can take out static electricity for an electrified sheet and electric contact outside with a scale and an earth plate 21. Moreover, the cross section of the contact section where the sheet 15 of the back end regulation plate 29 contacts is carrying out the shape of a wedge, and when many sheets 15 are laid in sheet loading equipment 1, it is generating the effectiveness of selling a sheet 15. Therefore, since a sheet 15 is sold and static electricity is discharged with the electric discharge needle 20 when a sheet 15 is laid, it becomes possible to prevent the double feed of a sheet 15.
[0025] In addition, repulsive force may be produced from said electric discharge needle 20 between sheets 15 by giving static electricity other than the approach mentioned above as a means to prevent the electrostatic adhesion by static electricity generated with the sheet 15.
<Example 4> The example 4 of this invention is explained along drawing. in addition, the fundamental configuration of sheet loading equipment -- an example 1 and abbreviation -- since it is the same, the same sign is attached and only difference is explained.

[0026] Drawing 5 - drawing 8 are drawings explaining the example 4 of this invention, and drawing 5 shows the perspective view of sheet loading equipment 1. Sheet loading equipment 1 had the press means 30, and this press means equips with the press section 31 the appearance shown in drawing 6 . The press side is constituted from a curved surface where radius of curvature is big by this press section 31 that it should always press in a field, even if the amount of the sheet currently loaded changes. And at the time of feed, when this press means 30 contacts the top sheet 15 by place constant pressure, since a low-ranking sheet (2nd less than sheet) is pressed down, it is fed only with the top sheet 15.

[0027] In addition, if the force in which the press means 30 pushes a sheet 15 becomes larger than the force in which the feed roller 18 tends to feed with a sheet 15, since it will no longer be fed with the top sheet 15, the force in which the press means 30 pushes a sheet 15 must be smaller than the feed force with the feed roller 18. Moreover, it is not fed with a sheet 15 even if the frictional force of the press means 30 and the top sheet 15 exceeds the frictional force of the feed roller 18 and a sheet 15.

[0028] In addition, the same effectiveness is acquired even if it is otherwise the thing of the roller format shown in drawing 7 , and the thing of the steeple configuration shown in drawing 8 , although mentioned above as a configuration of the press section 31 of the press means 30.

The example 5 of <example 5> this invention is explained along drawing. in addition, the fundamental configuration of sheet loading equipment -- an example 4 and abbreviation -- since it is the same, the same sign is attached and only difference is explained.

[0029] As shown in drawing 9 , image formation equipment 2 is equipped with the sheet loading equipment 1 with the press means 30, and it feeds with the sheet 15 loaded into sheet loading equipment 1 with the feed roller 18, and imprints the toner image currently formed on the photo conductor 35 through the conveyance roller 33 and the resist roller 34 on this sheet 15 via the conveyance guide 32. Then, the sheet 15 by which image formation was carried out through the fixing assembly 38 with the conveyance belt 37 is discharged, and image formation actuation is completed. By using such a sheet feed means 1, since the double feed of the sheet 15 with which it was fed has not been carried out, it becomes possible [reducing poor conveyance, such as a jam, during conveyance].

[0030]

[Effect of the Invention] It became possible to improve the separability of a sheet by discharging static electricity which the sheet was sold by carrying out the sequential location gap of the sheet which a back end regulation means to have regulated the back end of the sheet which was loaded like according to this invention explained above was established, and this regulation means raised the back end section of a sheet, or was loaded, and was generated on the sheet with an electric-discharge means. Moreover, by forming an oscillating generating means in the stowage material which is carrying out the loading receipt of the sheet, vibration was given to the stuck sheet, the separability of a sheet has been improved by this vibration, it became possible to prevent a double feed, a jam, etc. of the sheet loaded by pressing the further top sheet with a press means, and the dependability of equipment improved.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The side elevation of the sheet loading equipment applied to the example 1 of this invention.
[Drawing 2] The side elevation of the sheet loading equipment applied to the example 2 of this invention.
[Drawing 3] The plan of the sheet loading equipment applied to the example 3 of this invention.
[Drawing 4] The side elevation of the sheet loading equipment applied to the example 3 of this invention.
[Drawing 5] The perspective view of the sheet loading equipment applied to the example 4 of this invention.
[Drawing 6] The side elevation of the press means applied to the example 4 of this invention.
[Drawing 7] The side elevation of the press means of others which are applied to the example 4 of this invention.
[Drawing 8] The side elevation of the press means of others which are applied to the example 4 of this invention.
[Drawing 9] The side elevation of the image formation equipment applied to the example 5 of this invention.
[Drawing 10] The plan of the sheet loading means applied to explanation of a Prior art.
[Drawing 11] The side elevation of the sheet loading means applied to explanation of a Prior art.
[Description of Notations]
2 Image Formation Equipment
11 Frame (Stowage Material)
20 Electric Discharge Needle (Electric Discharge Means)
25 Back End Regulation Plate (Back End Regulation Means)
26 Weight (Oscillating Generating Means)
27 Motor (Oscillating Generating Means)
30 Press Means
31 Press Section

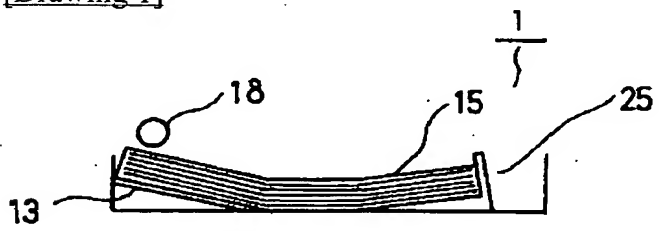
[Translation done.]

* NOTICES *

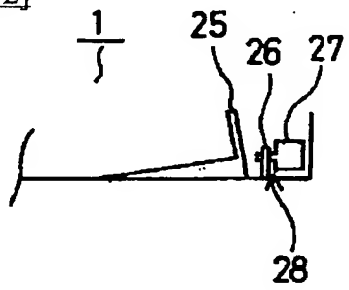
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Drawing 2]



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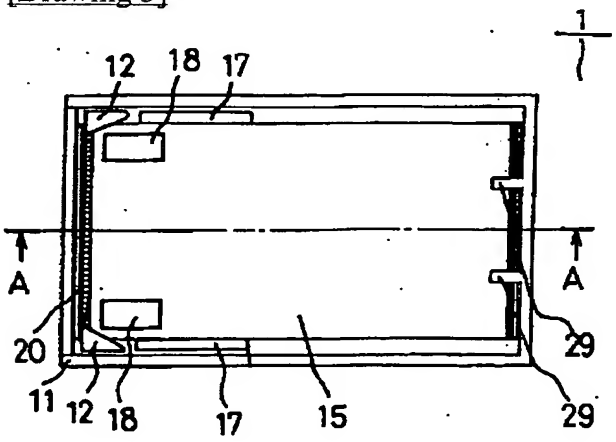
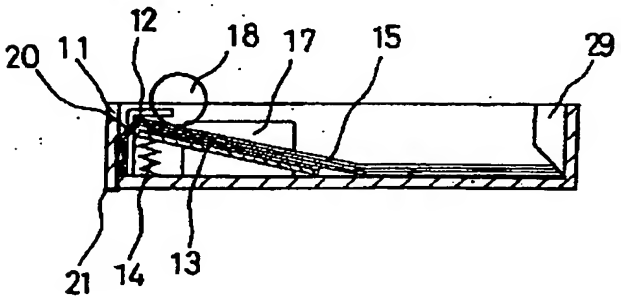


[Drawing 4]



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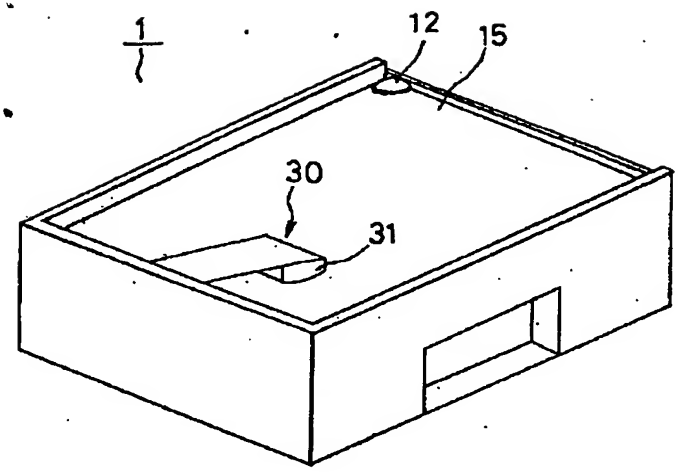

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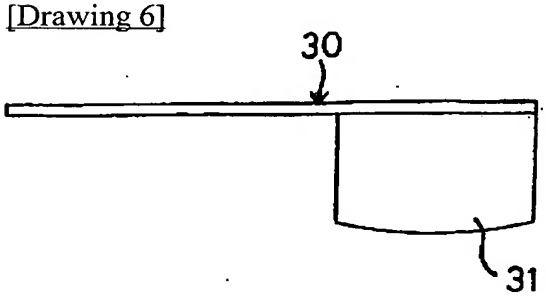
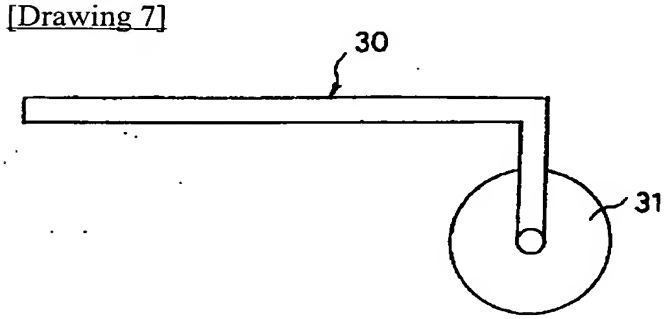


[Drawing 7]



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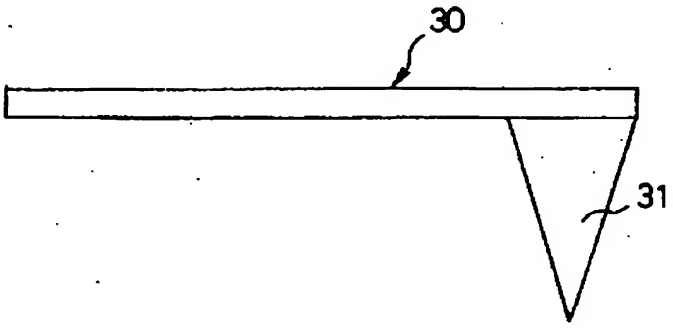
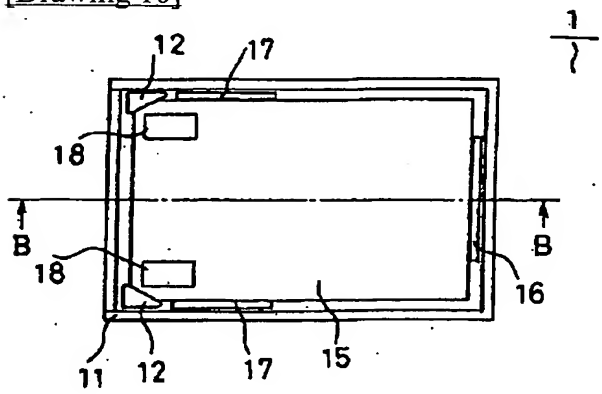


[Drawing 10]



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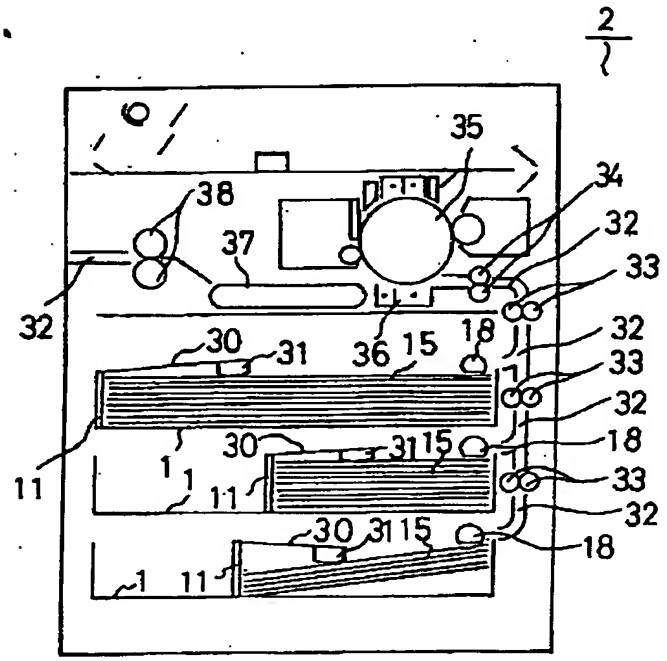
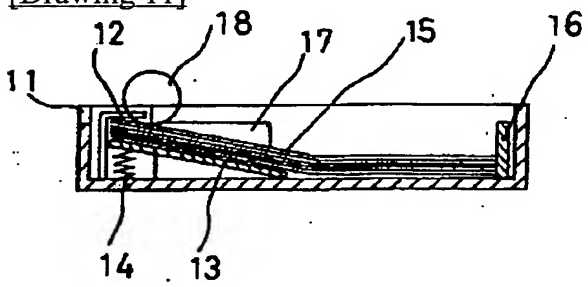


[Drawing 11]



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